

METHOD AND APPARATUS FOR VACUUM PRESSING  
ELECTROCHEMICAL CELL COMPONENTS

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BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to assembling electrochemical cell components.  
10 More particularly, the invention relates to using a bonding agent such as cements, glues, solders, adhesives and the like to bond components or subassemblies of an electrochemical cell or stack.

Description of the Related Art

15 Conventional construction of fuel cell stacks, electrolyzer stacks, or gas (hydrogen or oxygen) concentrator stacks, especially proton exchange membranes (PEM) stacks, requires a large number of substantially flat or planar components or subassemblies (including bipolar plates, flowfields, membrane and electrode assemblies, and, optionally, cooling plates) to be assembled between a pair of heavy  
20 metal endplates. The entire assembly is normally placed in compression, much like a filter press, through the use of a series of long threaded metal rods (tie rods) extending from one endplate of the assembly to the other endplate, with nuts or other fasteners on either end. The compression forces exerted through the tie rods normally compress a gasket, o-ring or similar device that is inserted between the sealing  
25 surfaces, thereby sealing any gases or liquids inside the electrochemical cell stack.

Electrochemical stacks are beginning to include adhesives for bonding the electrochemical cell stack components together, without the need for heavy endplates, tie bars, gaskets or o-rings. The adhesive bonds the components together and seals the gases and/or liquids inside the electrochemical cell stack. The resulting  
30 electrochemical cell stack is much lighter and smaller than a traditional stack. While